

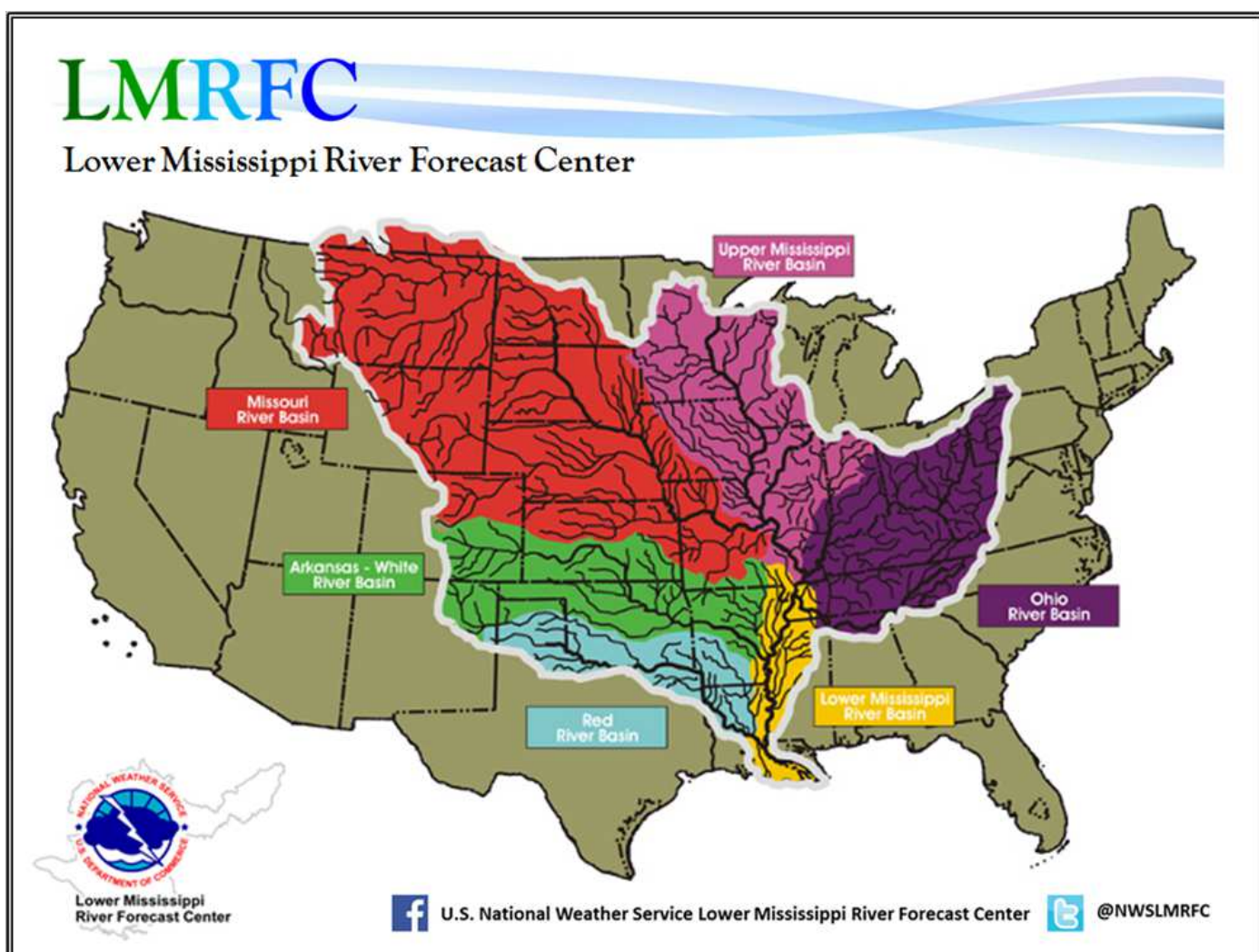
## February Monthly Educational Module

### “All about the LMRFC’s Partners”

#### Day 1

Have you ever wondered why the LMRFC works with partners? Well, the answer is simple. Take a look at the graphic below. Many of the rivers and tributaries in the LMRFC area extend beyond our governing area. And, because the LMRFC covers such a large area with several handoff points, we must work with many entities inside and outside our agency to get all the information we need for our forecasts.

So, this month, we will explore who our partners are, what do they do, and how we work together. We hope you enjoy what we have in store for you and understand a little bit more about what we do on a daily basis.




## Day 2

The first partner that we would like to highlight is the National Weather Service's Weather Forecast Offices (WFOs)! On a daily basis, we work with 18 NWS WFOs across 12 states. You can check out a list of these offices with their Facebook and Twitter accounts on the next page. To learn more about these Weather Forecast Offices and how we work together, check out the graphic below. You can also visit your local Weather Forecast Office's webpage with the link here: <http://www.weather.gov/>

In the future, we will devote a module to all the river basins in the LMRFC, which will include the WFO that is in charge of each river basin. In the meantime, you can find out which office is in charge of the river nearest you by viewing the river forecasts on our website. The office will be listed in the top left hand corner of the forecast. Check it out here:


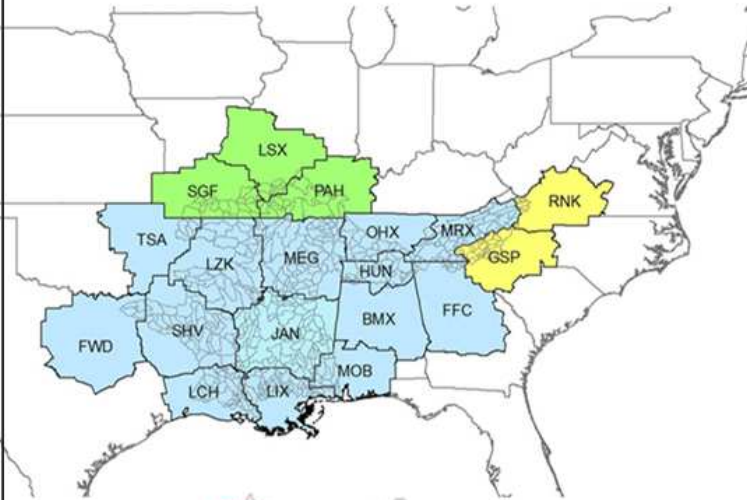
<http://water.weather.gov/ahps2/hydrograph.php?wfo=lix&gage=bxal1>



# LMRFC



Lower Mississippi River Forecast Center

## Weather Forecast Offices



Lower Mississippi River Forecast Center

- These are local NWS branches responsible for providing forecasts and issuing watches/warnings to protect lives, property, and the economy for their respective areas
- There are 18 WFOs across 12 states in the LMRFC area
- The LMRFC provides:
  - 5 day Hydrologic Forecasts
  - Flash Flood Guidance Products
  - Contingency Forecasts for WFOs to issue flood watches/warnings.
- Collaborate with WFO forecasters during high impact events, as well as with research projects and development work.
- Each WFO has a Service Hydrologist or Hydrology Focal Point who is the liaison between the RFCs and the WFOs

 U.S. National Weather Service Lower Mississippi River Forecast Center  @NWSLMRFC

<u>Station ID</u>	<u>Office Name/Facebook Account</u>	<u>Twitter Account</u>
LIX	U.S. National Weather Service New Orleans Louisiana	@NWSNewOrleans
LCH	U.S. National Weather Service Lake Charles Louisiana	@NWSLakeCharles
MOB	U.S. National Weather Service Mobile Alabama	@NWSMobile
JAN	U.S. National Weather Service Jackson Mississippi	@NWSJacksonMS
SHV	U.S. National Weather Service Shreveport Louisiana	@NWSShreveport
MEG	U.S. National Weather Service Memphis Tennessee	@NWSMemphis
OHX	U.S. National Weather Service Nashville Tennessee	@NWSNashville
HUN	U.S. National Weather Service Huntsville Alabama	@NWSHuntsville
GSP	U.S. National Weather Service Greenville-Spartanburg SC	@NWSGSP
MRX	U.S. National Weather Service Morristown Tennessee	@NWSMorristown
LSX	U.S. National Weather Service Saint Louis Missouri	@NWSStLouis
LZK	U.S. National Weather Service Little Rock Arkansas	@NWSLittleRock
PAH	U.S. National Weather Service Paducah Kentucky	@NWSPaducah
SGF	U.S. National Weather Service Springfield Missouri	@NWSSpringfield
FFC	U.S. National Weather Service Peachtree City Georgia	@NWSAtlanta
FWD	U.S. National Weather Service Fort Worth Texas	@NWSFortWorth
TSA	U.S. National Weather Service Tulsa Oklahoma	@NWSTulsa
RNK	U.S. National Weather Service Blacksburg VA	@NWSBlacksburg




## Day 3


Because several of our river basins extended beyond our governing boundary, the Lower Mississippi River Forecast Center (LMRFC) has “handoff” points. Handoff points are the first forecast points where rivers outside the LMRFC boundary enter the LMRFC area. In order for the LMRFC forecasters to issue the most accurate forecasts, we have to account for the flow on the rivers outside of our boundaries that enter into our area. Therefore, we have to obtain discharge and stage data for upstream locations for our handoff points.

One of the ways we get these data is through our neighboring River Forecast Centers (RFCs). This is why RFCs are a critical partner to our daily operations. Although we share a boundary with 6 RFCs, we only receive handoff data from 3 other river forecast centers (RFCs). Can you guess which 3 they are? Check out the graphic to see which ones they are and learn more about how we work with other RFCs.

If you would like more information on the National Weather Service’s River Forecast Centers, check out the link here: <http://water.weather.gov/ahps/rfc/rfc.php>




**Lower Mississippi River Forecast Center**



Lower Mississippi River Forecast Center


### River Forecast Centers

Purpose is to mitigate the loss of life and property by providing timely and accurate river and flood forecasts




National Weather Service River Forecast Centers

- The LMRFC shares borders with 6 RFCs but get handoff points from 3 RFCs:
  - Ohio River data from OHRFC
    - Handoff Point– Smithland, KY
  - Mississippi River data from NCRFC
    - Handoff Point– Chester, IL
  - Arkansas River data from ABRFC
    - Handoff Point– Pine Bluff, AR
  - Red River data from ABRFC
    - Handoff Point– Fulton, TX
- The LMRFC coordinates Flood Outlook Products with other RFCs and collaborates with other RFC forecasters during flooding events, as well as with research projects and development work.



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## Day 4

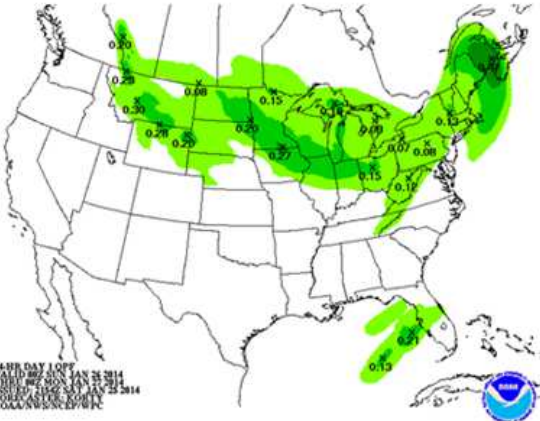
Next, we are highlighting the National Weather Service's Weather Prediction Center (WPC)! The Weather Prediction Center is one of 9 service centers in the National Weather Service for environmental prediction and is the go to center for high impact precipitation events and forecast guidance. Because river stages and reservoir operations are primarily driven by precipitation, the LMRFC uses WPC guidance and forecasts on a daily basis in order to get the most accurate precipitation and river forecasts. To learn more about the Weather Prediction Center's purpose in LMRFC operations, check out the graphic below. You can also follow them on Facebook and Twitter or check out their website here: <http://www.wpc.ncep.noaa.gov/>

Facebook: NOAA NWS Weather Prediction Center

Twitter: @NWSWPC

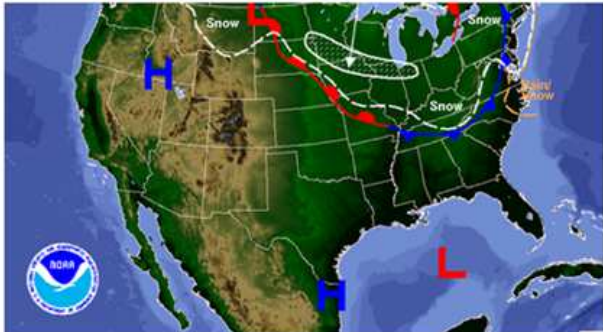
### Weather Prediction Center

WPC's mission is to contribute to the weather forecast process by issuing national forecasts, guidance, and analyses.





24 HR QPF  
VALID 00Z SAT JAN 25 2014  
TO 00Z SUN JAN 26 2014  
UNIT: INCHES  
NOAA/NWS/NCEP/WSR

- On a daily basis, the LMRFC uses WPC's products for guidance on precipitation amounts that go into the river models and forecasts. Some of these products include:
- Quantitative Precipitation Forecast (QPF) – Covers the accumulative rain/snow amounts (Pictured – Top Left)
- Surface Analysis – Shows current surface conditions (Pictured - Bottom Left)
- Excessive Rainfall Product – Highlights areas of heavy rainfall that exceed flash flood guidance
- Winter Weather Forecast – Covers the amount of heavy snow and icing expected
- Short Term Forecast – Covers more details for the first 6 - 60 hours of the precipitation forecast
- Medium-Range Public Forecast - Covers more details for Day 3 - Day 7 of the precipitation forecast
- Numerical Model Diagnostics - Discusses model interpretation including similarities/differences
- Tropical Cyclone Forecasts – Collaboration amongst the National Hurricane Center, Weather Forecast Offices, and River Forecast Centers on precipitation forecasts during tropical systems



Weather Forecast for Sat, Jan 25, 2014, issued 3:42 PM EST  
DOC/NOAA/NWS/NCEP/Weather Prediction Center  
Prepared by Hamrick based on WPC, SFC and NHC forecasts

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## Day 5

Next up is the National Hurricane Center! The National Hurricane Center (NHC) is another one of the 9 service centers in the National Weather Service for environmental prediction and is a critical partner for the Lower Mississippi River Forecast Center (LMRFC), especially during hurricane season. However, they also serve a vital role in our research and development projects year round. During hurricane season, LMRFC forecasters will use NHC's products and forecasts, like the Tropical Weather Outlooks and Tropical Cyclone Updates, for guidance in the river forecasting process. The LMRFC will also participate in advisory and coordination calls amongst the National Hurricane Center, Weather Prediction Center, and Weather Forecast Offices. To learn more about the National Hurricane Center and its role in the LMRFC operations, check out the graphic below. You can also follow them on Facebook and Twitter (listed below) or check out their website here: <http://www.nhc.noaa.gov/>

The National Hurricane Center is a great resource for the most up-to-date tropical cyclone updates and hurricane educational preparedness information. You can also check out your local Weather Forecast Office for more tropical information for your local area.


Facebook: NOAA NWS National Hurricane Center

Twitter: @NHC\_Atlantic and @NHC\_Pacific

### National Hurricane Center

Coastal Watches/Warnings and 5-Day Forecast Cone for Storm Center

Click image to zoom in - Download GIS data  
Other images: 5-Day track on - 3-Day track off - Interactive




Atlantic Graphical Tropical Weather Outlook

This product is updated at approximately 2 AM, 8 AM, 2 PM, and 8 PM EDT from June 1 to November 30. Special outlooks may be issued as conditions warrant. Place your mouse cursor over areas of interest for more information. Archived Outlooks

#### Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida



800 AM EDT WED SEP 11 2013 Satellite Image: 0652 AM EDT

Outlined areas denote current position of systems discussed in the Tropical Weather Outlook. Color indicates probability of tropical cyclone formation within 48 hours.

Low <30% Medium 30-50% High >50%

Go to Eastern Pacific Outlook

- NHC's mission is to save lives, mitigate property loss, and improve economic efficiency by issuing the best watches, warnings, forecasts, and analyses of hazardous tropical weather.
- NHC provides tropical analysis and forecasts which are used by NWS Weather Forecast Offices and River Forecast Centers to issue local forecasts and warnings.
- NHC is the NWS source of all tropical cyclone data
  - Including center location, motion, minimum pressure, eye diameter, forecast positions, intensity, and wind speeds
- NHC issues track and intensity forecasts, tropical cyclone updates, and watches and warnings.
  - Includes wind, rainfall, and storm surge probabilities
  - Includes the Forecast/Cone Graphic (Pictured - top left)
- NHC provides discussions on observations, model guidance, and forecast uncertainties
- NHC provides a general assessment of activity in the tropics
  - Highlights areas of disturbed weather and the potential for tropical cyclone formation (Pictured- bottom left)
- NHC issues seasonal forecasts and monthly tropical weather summaries

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## Day 6

Over the previous posts, we mentioned that the Weather Prediction Center and the National Hurricane Center are key center partners for the Lower Mississippi River Forecast Center; however, it is important to note that the LMRFC also works with other National Weather Service National Centers including the Climate Prediction Center, Storm Prediction Center, Ocean Prediction Center, National Center for Environment Prediction Central Operations, and Tsunami Warning Center. Now that we have highlighted the LMRFC partners that are internal agencies, it is time for us to move onto our partners outside of the National Weather Service.

The first external agency that we will cover is the United States Geological Survey (USGS). The USGS serves the U.S. as the largest water, earth, and biological science and civilian mapping agency and is responsible for collecting, monitoring, analyzing, and providing scientific understanding about natural resource conditions, issues, and problems. Because the USGS deals with water, naturally, it is one of the Lower Mississippi River Forecast Center's key partners! To learn more about the USGS and its role in the LMRFC daily operations, check out the module graphic below. You can also check them out on Facebook and Twitter (listed below) or visit their website here: <http://www.usgs.gov/>

Twitter: @USGS and @USGSNewsWater

Facebook: U.S. Geological Survey and USGS News: Water

### United States Geological Survey (USGS)

The USGS' mission is to provide reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.



Daily Streamflow Conditions

Thursday, February 13, 2014 13:00ET



- The USGS has 6 Science Mission Areas, but the LMRFC primarily works with the Water Mission Area.
- River forecasts need the most accurate and reliable river data, which includes river stages and discharge measurements.
- This is why the LMRFC must work with the USGS to get accurate and timely river data.
- The USGS is responsible for collecting, quality controlling, disseminating, and maintaining hydrologic datasets.
- The USGS achieves this responsibility by:
  - Installing and maintaining river and rain gages (Picture - far left)
  - Collecting and providing real-time stream flow data needed from gages and observations
  - Creating rating curves and hydrographs which are tools used in the LMRFC's hydrologic models
- The USGS also provides additional support during flooding or high water events. This is achieved by:
  - Taking additional measurements
  - Installing deployable gages for additional data



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## Day 7

Another external agency that serves an important role in being an LMRFC partner is the Tennessee Valley Authority (TVA)! TVA is a corporation owned by the U.S. government which controls reservoir operations and navigation on the Tennessee River, while providing power and water supply, as well as land management for parts of 7 states in the Tennessee Valley area. Check out the graphic below to learn more about TVA and its role in the LMRFC daily operations. For more information, visit their website here: <http://www.tva.gov/>. Or, you can follow them on social media listed below.


Facebook: Tennessee Valley Authority

Twitter: @TVA\_Newsroom



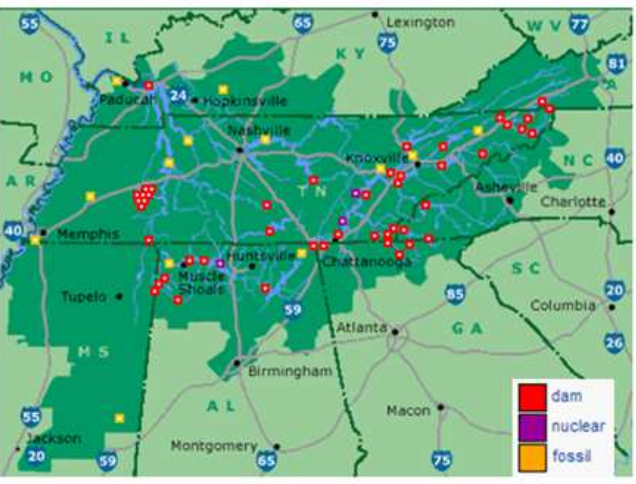
# LMRFC

Lower Mississippi River Forecast Center





## Tennessee Valley Authority (TVA)

TVA's mission is to provide power supply for parts of 7 states; flood control, navigation and land management for the Tennessee River system; and assist utilities and state and local governments with economic development.



- TVA's boundary is defined by all the rivers and tributaries that flow into the Tennessee River.
- TVA controls reservoirs and dams, nuclear plants, and fossil plants within their governing area. (Pictured on the left)
- Of TVA's 47 reservoirs, 46 are in the LMRFC area.
- TVA has its own rain and river gages, as well as its own river forecast center.
- The LMRFC works closely with TVA to get reservoir release schedules that go into river forecasts. The most well known:
  - Barkley Dam on the Cumberland River
  - Kentucky Dam on the Tennessee River
  - Tims Ford Reservoir on the Elk River
  - Normandy Reservoir on the Duck River
- The LMRFC also gets TVA's river and rain gage data to help in river forecasting.
- TVA provides development collaboration and hydraulic modeling guidance to the LMRFC.
- In return, the LMRFC provides TVA with precipitation forecasts and headwater forecasts for the Tennessee River.
- TVA and the LMRFC also coordinate during flooding events

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## Day 8

Next up is the United States Army Corps of Engineers (USACE)! First, let's cover a little background information on how the LMRFC is connected to the USACE. In the USACE, there are several missions; one of the missions is the Civil Works mission. The USACE Civil Works programs include water resource development activities including flood risk management, navigation, emergency response, recreation, and infrastructure and environmental stewardship. Because the Civil Works mission is revolved around water management and control, the LMRFC primarily works with this mission for daily operations.

As for the LMRFC daily operations, we work with the USACE to get vital information needed in the river forecast process. For those of you who do not know, many of the rivers in the LMRFC area have Locks and Dams along them for flood control, navigation, power and water supply, and recreation. Because many of these Locks and Dams are owned and operated by the USACE, we have to work closely with the USACE to know how much water is going to be released from those structures. To learn more about the USACE and why they are important to the LMRFC, check out the graphic below. For more information on the USACE, check out their website here: <http://www.usace.army.mil/>. You can also follow them on Facebook and Twitter (see below).

Facebook: U.S. Army Corps of Engineers, Headquarters

Twitter: @USACEHQ




## Day 9

Another LMRFC partner that we would like to highlight is the Federal Emergency Management Agency (FEMA)! FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards. Since floods and hurricanes are included in these hazards, the LMRFC must work closely with FEMA to protect lives and property.

FEMA isn't the only emergency management resource that we work with though. We also work with emergency managers on the state and local level as well. To learn more about how the LMRFC works with the emergency management community, check out the graphic below. You can also check out FEMA's website with the first link listed below, as well as each state emergency management agency with the second link.

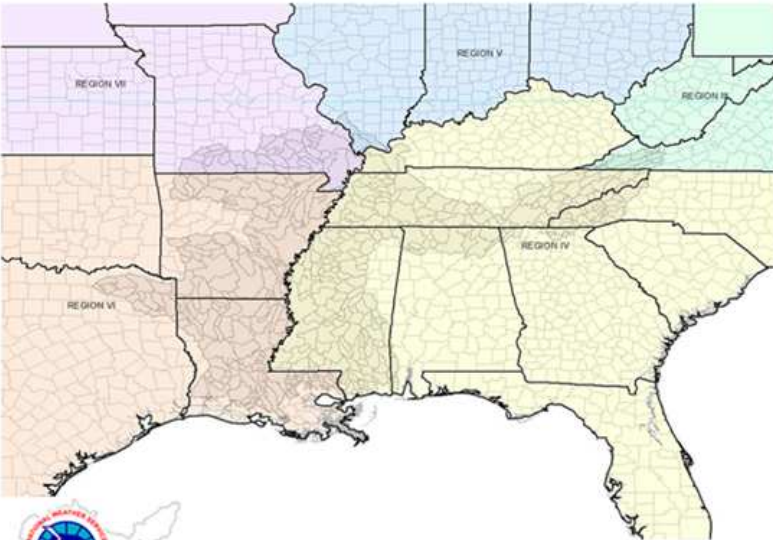
<http://www.fema.gov/>

<http://www.fema.gov/state-offices-and-agencies-emergency-management>




**LMRFC**  
Lower Mississippi River Forecast Center

### Federal Emergency Management Agency (FEMA) and Emergency Managers





The map shows the Lower Mississippi River basin divided into FEMA Regions V, IV, and VI. Region V is in the north (purple), Region IV is in the center (yellow), and Region VI is in the south (orange). The Mississippi River is shown flowing through the center of the map.

- The LMRFC works with its 18 Weather Forecast Offices to coordinate with FEMA, state emergency management agencies, and local emergency managers.
- The LMRFC area is covered by 5 different FEMA Regions and 12 state emergency management agencies. (Pictured – left)
- The LMRFC provides daily river forecasts, as well as additional forecasts during flood events for decision support and emergency response.
- The LMRFC also provides Flood Outlook and Spring Flood Outlook Products for emergency managers to use for longer term planning.
- Lastly, the LMRFC is a part of Silver Jackets, which is a collaboration amongst federal, state, and tribal agencies working to reduce the risk of flooding and other natural disasters.



Lower Mississippi River Forecast Center

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## Day 10

Next, the Lower Mississippi River Forecast Center would like to highlight our partners in the navigation community! We work closely with two primary partners in the navigation community. They are the Lower Mississippi River Committee (LOMRC) and the Gulf Intracoastal Canal Association (GICA). The LMRFC primarily serves these two partners by providing briefings on our weather and river forecasts during high water or lower water events. To learn more about these partners, check out the graphic below.

# LMRFC

Lower Mississippi River Forecast Center

## Navigation Community

**Gulf Intracoastal Canal Association (GICA)** - The mission of GICA is to ensure the Gulf Intracoastal Waterway is maintained, operated and improved to provide the safest, most efficient, economical and environmentally-sound water transportation route in our nation, serving petrochemical facilities, refineries, farms, mines, ports, commercial fisheries, recreation and more.

**Lower Mississippi River Committee (LOMRC)** - LOMRC is a committee of the Lower Mississippi River towing companies, formed to address navigation problems during significant changes in river conditions such as extreme low water and high water events. The committee has evolved to address all issues concerning the Lower Mississippi River navigation and is the major liaison between the towing industry, the Coast Guard, and the Army Corps of Engineers for river conditions between New Orleans, LA and Memphis, TN.



The LMRFC provides LOMRC and GICA with meteorology and hydrology briefings as well as additional support during high and low water events



U.S. National Weather Service Lower Mississippi River Forecast Center



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## Day 11

In our previous post, we highlighted two of our navigation partners; however, there is another LMRFC partner that is closely related to the navigation community...the United States Coast Guard! To learn more about the USCG and how it is related to the LMRFC, check out the graphic below. You can also check out their website here <http://www.uscg.mil/> or follow them on their social media accounts below.

Facebook: U.S. Coast Guard

Twitter: @USCG

# LMRFC

## Lower Mississippi River Forecast Center

### United States Coast Guard (USCG)

The USCG's mission is protect the maritime economy and the environment, defend our maritime borders, and save those in peril.

**U. S. Coast Guard Sector Commands**

**Command Boundaries**

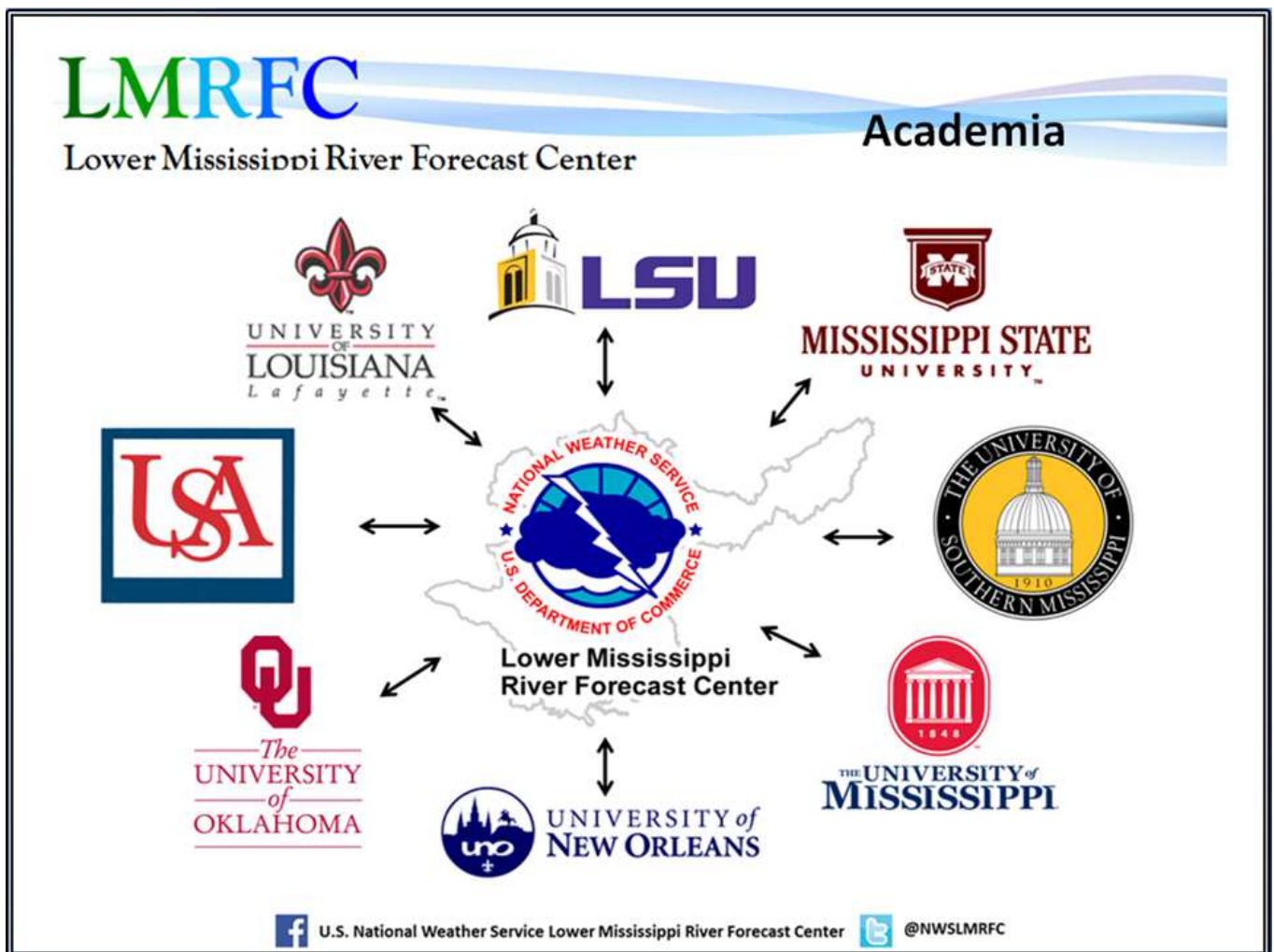
- Area Boundary
- District Boundary
- Economic Exclusion Zone

- The LMRFC encompasses 8 U.S. Coast Guard Sector Commands in 3 Districts (Pictured - left) including:
  - District 8
    - Sector Houston-Galveston
    - Sector New Orleans
    - Sector Lower Mississippi (Memphis)
    - Sector Upper Mississippi (St. Louis)
    - Sector Ohio Valley (Louisville)
    - Sector Mobile
  - District 5
    - Sector North Carolina
    - Sector Baltimore
  - District 7
    - Sector Charleston
- On a daily basis, the USCG uses the LMRFC's forecasts and products as guidance for monitoring river stages and navigation along major rivers in the LMRFC area.

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## Day 12

Last, but certainly not least, we would like to highlight all of our academia partners! Because the LMRFC conducts research and development projects, we work closely with members from the academic world. These partnerships allow our forecasters to work with professors and students to create new and improved operational tools so we can get you the best forecast we possibly can. To see all of the academia partners that we work with on a regular basis, check out the graphic below!



This is the last post for the Lower Mississippi River Forecast Center's February monthly educational module! We hope you all enjoyed learning all about the LMRFC's partners and how we work with them on a daily basis. And, we hope you will stick around for our next monthly module!